

Web-Based PC Loan Management for UUM Bursary

**This thesis is presented to the Graduate School
In fulfillment of the requirements for
Master of Science (Information and Communication Technology)
Universiti Utara Malaysia**

By

Ahmad Omar Saleh Shahrooj



KOLEJ SASTERA DAN SAINS
(College of Arts and Sciences)
Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PROJEK
(Certificate of Project Paper)

Saya, yang bertandatangan, memperakukan bahawa
(I, the undersigned, certify that)

AHMAD OMAR SALEH SHAHROOJ

calon untuk Ijazah
(candidate for the degree of) **MSc. (ICT)**

telah mengemukakan kertas projek yang bertajuk
(has presented his/her project paper of the following title)

WEB-BASED PC LOAN MANAGEMET FOR UUM BURSARY

seperti yang tercatat di muka surat tajuk dan kulit kertas projek
(as it appears on the title page and front cover of project paper)

bahawa kertas projek tersebut boleh diterima dari segi bentuk serta kandungan
dan meliputi bidang ilmu dengan memuaskan.
(that the project paper acceptable in form and content, and that a satisfactory
knowledge of the field is covered by the project paper).

Nama Penyelia Utama
(Name of Main Supervisor): **ASSOC. PROF. DR. WAN ROZAINI SHEIK OSMAN**

Tandatangan
(Signature)

: Rozaini

Tarikh
(Date)

: 8/8/08

PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a post-graduate degree from Universiti Utara Malaysia, I agree that the University Library may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in the whole or in part, for scholarly purposes may be granted by my supervisor or in his absence, by the Dean of Graduate School. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any materials for my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part should be address to:

Dean of Faculty of Information Technology

Universiti Utara Malaysia

06010 DUM Sintok

Kedah Darul Aman

Abstract

The twenty-first century have witnessed several major technological renaissances and many technological achievements as well, which led to a competition among many countries to adapt this trend. Malaysia had improved the infrastructure needed in the information and communication technology area, in order to provide the universities with the new technologies. Therefore the use of the technology becomes available inside the universities through its departments which make the idea of web based application for PC loan in UUM Bursary achievable.

To develop the web-based PC loan management, the study will use the methodology for this study is based on the general methodology in research design, because it is have the logical phases that used to develop a prototype for web-based PC loan management to make the applying for loan process in UUM Bursary more efficient and accurate and helping to solve the problems or the difficulties in the manual system by facilitate the way to approve the ordered loan. Beside that it is improve the information management in the loan applications for UUM bursary.

Finally, the system is tested and the result confirms that the proposed system is capable to record a successful loan applications.

ACKNOWLEDGEMENT

Praise be to Allah, Most Gracious, Most Merciful whose blessing and guidance have helped me through entire project works. It would not have been possible for me to complete without support of my family, my most sincere appreciation goes to my beloved parents, for their patience and prayers. And to my brother Amjad, with all his love and support in every part of my studying.

I would like also to express my deepest appreciation to my supervisor Assoc Prof Dr. Wan Rozaini bt Sheik Osman for her assistance, patience, and endurance throughout this project

I would also like to thank to all my friends especially Ayman Alkhaldi, Dr.Ahmad Shatat and Naji Alzaza for their sharing of knowledge, endless kindness, advice and support given to me during the course of study

Dedicated to,,,,,,,,

My Loving Parents

Contents

PERMISSION TO USE	II
ACKNOWLEDGEMENT	III
ABSTRACT	IV
CONTENTS	VI
LIST OF FIGURES.....	IX
LIST OF TABLES	X
1. INTRODUCTION.....	2
1.1 Introduction.....	2
1.2 Background to the study.....	2
1.3 Problem Statement	4
1.4 Research Questions.....	5
1.5 Objectives of study	5
1.6 Scope and Limitation of the Study	6
1.7 Organization of Thesis.....	6
1.8 Summary.....	6

2. LITERATURE REVIEW.....	8
2.1 Introduction	8
2.2 Overview of Web.....	8
2.2.1 Web application.....	9
2.3 PC Loan.....	11
2.4 Web-Based Loan Management.....	12
2.5 Web-based Loan Management System.....	12
2.6 Web-Based Online Student Loans Information System.....	13
2.7 Online PC Loan Application in University of Louisville	14
2.8 Online loan applications in government.....	15
2.9 Program language.....	16
2.9.1 ASP.NET Overview.....	17
2.9.2 Page and Controls Framework.....	17
2.9.3 ASP.NET Compiler.....	18
2.9.4 Security Infrastructure.....	18
2.9.5 ASP.NET Configuration.....	18
2.9.6 ASP.NET Architecture.....	19
2.10 Summary.....	20
3. METHODOLOGY.....	22
3.1 Introduction.....	22
3.2 Research Methodology.....	22
3.2.1 Phase 1: Awareness of the Problem.....	23

3.2.2 Phase 2: Suggestion.....	24
3.2.3 Phase 3: Development.....	25
3.2.3.1 The process of prototyping involves the following steps.....	26
3.3 Phase 4 and 5: Evaluation and Conclusion.....	26
3.4 Summary	27
4 ANALYSIS AND DESIGN	29
4.1 Introduction.....	29
4.2 Analysis.....	29
4.2.1 Requirements Determination.....	30
4.2.2 Use Case Diagram.....	31
4.2.3 System's Requirements.....	33
4.3 Design.....	35
4.3.1 Logical Design.....	35
4.3.1.1 The use case diagram for the whole system	36
4.3.1.2 Use case specification.....	37
4.3.1.3 Sequence diagram.....	50
4.3.1.4 Class diagram.....	57
4.4 Physical Design.....	57
4.5 Implementation.....	58
4.6 Evaluation.....	61
4.6.1 User testing (questionnaire):	61

4.6.1.1 Respondents.....	61
4.6.1.2 Structure of the questionnaire.....	61
4.6.1.3 Conducting the Test.....	62
4.6.1.3.1 Analysis of the demographic questions.....	62
4.6.1.3.2 Analysis of the User Testing:	63
4.7 Summary.....	64
5 CONCLUSION	67
5.1 Introduction.....	67
5.2 Finding.....	67
5.3 Problems and Limitations.....	68
5.4 Contribution of Study.....	69
5.5 Future Work.....	69
5.6 Summary	70
References	71
Appendices	77
Appendix A: Screens for the Web-Based PC Loan Management.....	77
Appendix B: Questionnaire for Web-Based PC Loan Management.....	90
Appendix C: list of output result for usability evaluation.....	91

List of Figures

2.1	Web-Based application	11
2.2	Web-Based Online Student Loans Information System.....	14
2.3	ASP.NET Architecture	19
3.1	The General methodology of Design Research.....	23
3.2	The prototyping approach.....	25
4.1	Use Case Diagram for Web-Based PC Loan Management	37
4.2	Use Case Diagram for login the system.....	38
4.3	Sequence Diagram for login to the system.....	50
4.4	Sequence Diagram for apply application.....	51
4.5	Sequence Diagram for edit application.....	52
4.6	Sequence Diagram for satisfy application.....	53
4.7	Sequence Diagram for sanction loan.....	54
4.8	Sequence Diagram for print application.....	55
4.9	Sequence Diagram for search for application.....	56
4.10	Class diagram for Web-Based PC Loan Management.....	57
4.11	Flowchart for apply PC loan application algorithm.....	60
5.1	Login page.....	77
5.2	Apply application for PC loan1	78
5.3	Apply application for PC loan2.....	79
5.4	Apply application for PC loan3.....	80
5.5	Approve interface by Head of Department.....	81
5.6	Approve interface by Bursary officer.....	82
5.7	Approve interface by Program Manager.....	83
5.8	Approve interface by Bursary Management.....	84
5.9	Approve interface by Registrar.....	85
5.10	Approve interface by VC.....	86
5.11	Approve interface by all departments.....	87
5.12	Search for application.....	88
5.13	Print the application.....	89

List of Tables

4.1 Functional Requirement	34
4.2 H/W.S/W Specifications.....	58
4.3 Gender.....	62
4.4 Descriptive of all dimensions for Web-Based PC Loan Management.....	63

Chapter 1

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter provides a description to the study. It contains the background of the study, problem statement, and research questions, objectives of the study and scope and limitation of the study.

1.2 Background to the study

The rapid development of Internet technology World Wide Web in the past decade has dramatically increased the ways of solving complicated problems in many businesses fields such as organizations, firms, companies and universities. Some of organizations enhance their activities and promote their products through the web. And the web as a part of the internet application has changed the way of the business transactions through developing web applications in order to facilities the Business dealings (Sridharan, 2004). There are many features for the web such as the ease of use, universal accessibility, and ability of searching via the internet (Burners-Lee, 1997). Also there are a set of web services that enable such business to share the data among its own departments and parts, that's lead to enhance the management (Windley, 2003).

The contents of
the thesis is for
internal user
only

References

- Acunetix. (2008). Web Applications: What are they? What of them? Retrieved February 28, 2008 from <http://www.acunetix.com/websitesecurity/web-applications.htm>.
- Alan Dennis, Barbara Haley Wixom and David Tegarden. (2002). System Analysis & Design, An Object – Oriented Approach with UML. John Wiley & Sons, ISBN 0-471-41387-9.
- Antonio Carlos Carvalho. (2004). Sequencing ICT in Post-Conflict/Low-Capacity Countries Undergoing Decentralization
<http://www1.worldbank.org/publicsector/decentralization/March2005Seminar/3Carvalho/Carvalho%20Draft%20%20Sequencing%20ICT%20in%20Post-Conflict%20Countries%20Undergoing%20Decentralization.pdf>.
- Aripin B.Haji Che Mat. (2007). the lessons learnt from the Employee provident funds computer purchase withdrawal scheme (CPWS): A case study at Air Force College, Alor setar, Kedah, Msc ICT Project in UUM.
- Arrington C., Rayhan S. (2003). Enterprise Java and UML. 2nd Edition. Wiley & Sons, ISBN 0-47-126778-3.
- Athula Ginige and San Murugesan. (2001). Guest Editors' Introduction: Web Engineering— An Introduction IEEE MultiMedia, Volume 8 Issue 1 Publisher: IEEE Computer Society Press.
- Auckland. (2004). web application. Retrieved 17 February, 2008 from <http://www.cs.auckland.ac.nz/tukutuku/help.htm>.

Bob Baxley. (2003). what is a Web Application?. Boxes and Arrows. Retrieved 26 January, 2008 from http://www.bboxesandarrows.com/archives/what_is_a_web_application.php.

Bursary. (2008). Introduction. Retrieved 16 January, 2008 from <http://www.uum.edu.my/bend/pagebi/bendbi.html>.

Collard. R. (1999). *Test Design. Stqemagazine: Software Testing & Quality Engineering*. Retrieved October 29, 2007 from [http://www.softtest.org.uk/material/rosscollard I.pdf](http://www.softtest.org.uk/material/rosscollard%20I.pdf).

Computing and Information Technology Advisory Group (CITG). (2001). GENERIC COMPUTING Apply the principles of implementing and supporting a computerized accounting system. Retrieved March 13, 2008 from <http://www.nzqa.govt.nz/nqfdocs/units/pdf/6753.pdf>.

David Plans Casal. (2005). Advanced Software Development for Web application

David William Brown. (2002). An Introduction to Object-Oriented Analysis John Wiley & Sons, ISBN 0471371378. Retrieved March 10, 2008 from <http://www.wiley.com/college/brown/0471371378/ppt/ch06.ppt>.

Defense Finance and Accounting Service (DFAS). Department's financial management. (1999). FINANCIAL MANAGEMENT REFORM. Retrieved February 8, 2008 from <http://www.dod.mil/execsec/adr1999/chap14.html>.

Dennis G. Jerz (2000). Usability Testing: What is it? Retrieved February 22, 2008 from <http://jerz.setonhill.edu/design/usability/intro.htm>.

Geekazoid & Friends. (1999). GEEK SPEAK GLOSSARY. Retrieved January 22, 2008 from <http://www.geekazoid.com/geekspeak>.

George, J.F., Batra, D, Valacich, J.S. y J.A. Hoffer. (2004). Object-oriented systems analysis and design. Pearson Prentice Hall.

GUDIVADA, V. N., RAGHAVAN, V. V., GROSKY, W. I., AND KASANAGOTTU, R. (1997). Information retrieval on the World Wide Web. *IEEE Internet Comput.* 1, 15, 58-68.

Hanselman, S .(2006). *Professional ASP.NET 2.0 Special Edition (Wrox Professional Guides)* (1st ed). Newwork: Geoffrey.

Hevner, A., March, S., Park, J. and Ram, S. (2004). "Design Science in Information Systems Research." *MIS Quarterly* 28(1): 75-105.

Justus D. Naumann, A. Milton Jenkins. (2000). Prototyping: The New Paradigm for Systems Development .*MIS Quarterly*, Vol. 6, No. 3 (Sep., 1982), pp. 29-44.

Kendall, K. E. & Kendall, J. (2005). Systems Analysis and Design (Sixth Edition), Prentice Hall.

Kothari, C. R. (1985). *Research Methodology, Methods and Technique*. Delhi: Wiley Eastern Limited.

Mandar S. Chitnis, Lakshmi Ananthamurthy, and Pravin S. Tiwari. (2002). The UML Class Diagram. Retrieved January 27, 2008 from <http://www.developer.com/design/article.php/2206791>.

Marko Boger, Thorsten Sturm, Erich Schildhauer and Elizabeth Graham. (2004). Poseidon for UML Users Guide. Retrieved January 27, 2008 from http://www-gris.det.uvigo.es/~avilas/poseidon_users_guide.pdf.

Martin Fowler. (2004). UML Distilled: A Brief Guide to the Standard Object Modeling Language. (Third edition). Addison-Wesley.

Maryland Department of Housing and Community Development. (2005). DHCD's One-Stop Universal Application. Retrieved February 16, 2008 from http://www.ncsha.org/uploads/06AW_MD_MI_Tech.pdf.

Mitchell S. (2005). ASP.NET Data Web Controls Kick Start (2nd ed). Boston: Bill and Srinivasa.

M. P. SELVAN AND K. S. SWARUP. (2004). Object-oriented power system analysis. Retrieved February 28, 2008 from <http://journal.library.iisc.ernet.in/vol200405/paper2/abst-selvan.pdf>.

Object Management Group (OMG). (1997). UML Notation Guide. Retrieved March 4, 2008 from <ftp://ftp.omg.org/pub/docs/ad/97-08-05.pdf>.

Ondrej Rysavy and Frantisek Bures. (2004). Formal Abstract Architecture for Use Case Specifications. Proceedings of the 11th IEEE International Conference and Workshop on the Engineering of Computer-Based Systems (ECBS'04) 0-7695-2125-8/04.

Phillip J. Windley. (2003). Enabling Web Services. Retrieved February 14, 2008 from <http://www.windley.com>.

Purao, S. (2002). "Design Research in the Technology of Information Systems: Truth or Dare." GSU Department of CIS Working Paper. Atlanta.

Rational Software Corporation. (2003). Rational unified process. On-line version.

Ruth Malan and Dana Bredemeyer. (2001). Functional Requirements and Use Cases Retrieved February 14, 2008 from http://www.bredemeyer.com/pdf_files/functreq.pdf.

Shelley Elmlad. (No date). Online Software. Retrieved February 14, 2008 from http://financialsoft.about.com/od/glossaryindexo/g/OnlineApp_def.htm.

Sommerville, I. (2001). Hands-On Prototyping in System Analysis and Design Software Engineering, Addison Wesley.

Sridharan K. (2004). A course on web languages and web-based applications. Education, IEEE Transactions on Volume 47, Issue 2, May 2004 Page(s): 254 - 260 Digital Object Identifier 10.1109/TE.2004.825228.

Taylor, Trevor. (2006). Web Competencies for IT Students. Information Technology Based Higher Education and Training, 2006. ITHET 06. 7th International Conference on July 2006 Page(s):563 – 570. Digital Object Identifier 10.1109/ITHET.2006.339815.

Texas Guaranteed. (2002). TG Launches Web-based Loan Management System. Retrieved February 15, 2008 from <http://www.tgslc.org/pdf/press021205.pdf>.

Tim Berners-Lee. (1997). Key Web Features. Retrieved February 25, 2008 from <http://www.livinginternet.com/w/wp.htm>.

University of Louisville. (2006). PC loan program. Retrieved January 19, 2008 from <http://louisville.edu/hr/benefits/pc-loan>.

University Utara Malaysia Bursary. (2008). Introduction. Retrieved January 17, 2008 from <http://www.uum.edu.my/bend/pagebi/bendbi.html>.

University Teaching and Learning Centre (UTLC). (2008). LearningCare Portal System. Retrieved February 13, 2008 from http://www.uum.edu.my/utlc/Brochure_learn care.pdf.

USA Funds. (2002). Annual Report. Retrieved February 18, 2008 from <http://www.usafunds.org/About/FY2002results.html>.

Vaishnavi & Kuechler. (2007). Design Research in information system. Retrieved January 28, 2008 from <http://www.isworld.org/Researchdesign/drisISworld.htm>.

Walther S. (2005). *ASP.NET Unleashed* (1st ed). Boston: Allyn and Bacon. Waston, K. (2005). *Beginning ASP .NET 2.0 E-Commerce in C# 2005* (1 st ed) Florida: Dari.

Waston, K. (2005). *Beginning ASP .NET 2.0 E-Commerce in C# 2005* (1 st ed) Florida: Dari.

Webopedia. (2008). CERN. Retrieved February 15, 2008 from <http://www.webopedia.com/TERM/C/CERN.htm>.

Xiaoping Li. (2004). Web-Based Online Student Loans Information System. Retrieved February 20, 2008 from <http://poly.asu.edu/technology/dcst/Projects/May2004/XiaopingLi.pdf>.